This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) A method for determining a frequency error over at least one frequency search space for a received signal, the method comprising the steps of:

a) calculating a first noise estimation for a first frequency offset in a frequency search space;

b) calculating at least a second noise estimation for a second frequency offset in said frequency search space; and

c) determining a minimum noise estimation from said calculated noise estimations, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation.

2. (original) The method of Claim 1 further comprising the step of using said determined frequency error to perform a frequency adjustment.

3. (original) The method of Claim 2, wherein said received signal has a center frequency and said frequency error is used to adjust said center frequency.

4. (original) The method of Claim 2, wherein said signal is received into a receiver having a channel estimation filter, and said channel estimation filter is frequency adjusted using said frequency error.

5. (original) The method of Claim 1 further comprising:

performing steps a) and b) for a first channel characterization over a first frequency search space and determining a corresponding first preliminary minimum noise estimation;

performing steps a) and b) for at least a second channel characterization over a second frequency search space and determining a corresponding second preliminary minimum noise estimation; and

selecting the minimum noise estimation from said preliminary minimum noise estimations.

6. (original) The method of Claim 5, wherein each said channel characterization is based on at least one of a different Doppler hypothesis and a different delay spread hypothesis.

7. (original) The method of Claim 5, wherein the minimum noise estimation is selected based on weighting each of the preliminary noise estimations and comparing the weighted preliminary noise estimations.

8. (original) The method of Claim 5 further comprising selecting a channel estimation filter design based on the channel characterization corresponding to said selected minimum noise estimation.

9. (original) The method of Claim 1, wherein each of the frequency offsets are uniformly spaced and are adjacent to each other in the frequency search space.

10. (original) The method of Claim 1 further for determining a timing synchronization error for said received signal over at least one combined frequency and timing search space, wherein:

said first noise estimation is calculated for a first frequency and timing offset pair in a combined frequency and timing search space; and

said at least a second noise estimation is calculated for a second frequency and timing offset pair in said combined frequency and timing search space; and

said timing error is the timing offset corresponding to said minimum noise estimation.

11. (original) A method for determining a timing synchronization error over at least one timing search space for a received signal, the method comprising the steps of:

a) calculating a first noise estimation for a first timing offset in a timing search space;

b) calculating at least a second noise estimation for a second timing offset in said timing search space; and

c) determining a minimum noise estimation from said calculated noise estimations, wherein said timing error is the timing offset corresponding to said minimum noise estimation.

12. (original) The method of Claim 11 further comprising the step of using said determined timing error to perform a timing adjustment.

13. (original) The method of Claim 12, wherein said received signal is time adjusted using said timing error.

14. (original) The method of Claim 12, wherein said signal is received into a receiver having a channel estimation filter, and said channel estimation filter is time adjusted using said frequency error.

15. (original) The method of Claim 11 further comprising:

performing steps a) and b) for a first channel characterization over a first timing search space and determining a corresponding first preliminary minimum noise estimation;

performing steps a) and b) for at least a second channel characterization over a second timing search space and determining a corresponding second preliminary minimum noise estimation; and

selecting the minimum noise estimation from said preliminary minimum noise estimations.

16. (original) The method of Claim 15, wherein each said channel characterization is based on at least one of a different Doppler hypothesis and a different delay spread hypothesis.

17. (original) The method of Claim 15, wherein the minimum noise estimation is selected based on weighting each of the preliminary noise estimations and comparing the weighted preliminary noise estimations.

18. (original) The method of Claim 15 further comprising selecting a channel estimation filter design based on the channel characterization corresponding to said selected minimum noise estimation.

19. (original) The method of Claim 11, wherein each of the timing offsets are uniformly spaced and are adjacent to each other in the timing search space.

20. (original) A method for determining a frequency error and a timing synchronization error over at least one combined frequency and timing search space for a received signal, the method comprising the steps of:

a) calculating a first noise estimation for a first frequency and timing offset pair in a combined frequency and timing search space;

b) calculating at least a second noise estimation for a second frequency and timing offset pair in said combined frequency and timing search space; and

c) determining a minimum noise estimation from said calculated noise estimations, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation, and said timing error is the timing offset corresponding to said minimum noise estimation.

21. (original) A method for determining a frequency error over at least one frequency search space for a received signal, the method comprising the steps of:

for a first channel characterization over a first frequency search space,

calculating a first noise estimation for a first frequency offset in said first frequency search space;

calculating at least a second noise estimation for a second frequency offset in said first frequency search space; and

determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations;

for at least a second channel characterization over a second frequency search space,

calculating a first noise estimation for a first frequency offset in said second frequency search space;

calculating at least a second noise estimation for a second frequency offset in said second frequency search space; and

determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and

selecting a minimum noise estimation from said preliminary minimum noise estimations, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation.

22. (original) A method for determining a timing synchronization error over at least one timing search space for a received signal, the method comprising the steps of:

for a first channel characterization over a first timing search space,

calculating a first noise estimation for a first timing offset in said first timing search space;

calculating at least a second noise estimation for a second timing offset in said first timing search space; and

determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations;

for at least a second channel characterization over a second timing search space,

calculating a first noise estimation for a first timing offset in said second timing search space;

calculating at least a second noise estimation for a second timing offset in said second timing search space; and

determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and

selecting a minimum noise estimation from said preliminary minimum noise estimations, wherein said timing error is the timing offset corresponding to said minimum noise estimation.

23. (original) A method for determining a frequency error and a timing synchronization error over at least one combined frequency and timing search space for a received signal, the method comprising the steps of:

for a first channel characterization over a first combined frequency and timing search space,

calculating a first noise estimation for a first frequency and timing offset pair in said first combined frequency and timing search space;

calculating at least a second noise estimation for a second frequency and timing offset pair in said first combined frequency and timing search space; and

determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations;

for at least a second channel characterization over a second combined frequency and timing search space,

calculating a first noise estimation for a first frequency and timing offset pair in said second combined frequency and timing search space;

calculating at least a second noise estimation for a second frequency and timing offset pair in said second combined frequency and timing search space; and

determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and

selecting a minimum noise estimation from said preliminary minimum noise estimation, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation and said timing error is the timing offset corresponding to said minimum noise estimation.

24. (withdrawn) A receiver comprising:

an antenna for receiving a signal having a plurality of information bits;

receiver circuitry coupled to said antenna for converting said received signal into a digital baseband signal; and

a digital signal processor for processing said baseband signal to recover said plurality of information bits, said digital signal processor comprising:

a demodulator for demodulating said baseband signal, said demodulator including means for course frequency adjustment of said received signal, and course timing adjustment of said received signal;

means for determining a residual frequency error remaining after said course frequency adjustment and for using said residual frequency error to perform a subsequent frequency adjustment;

means for determining a residual timing error remaining after said course timing adjustment and for using said residual timing error to perform a subsequent timing adjustment;

a channel estimator, coupled to said means for determining a residual frequency error and to said means for determining a residual timing error, for generating at least one channel estimate; and

a bit detector for using said at least one channel estimate for recovering said plurality of information bits as a function of said subsequent timing and frequency adjustments.

25. (withdrawal) A receiver comprising:

an antenna for receiving a signal having a plurality of information bits;

receiver circuitry coupled to said antenna for converting said received signal into a digital baseband signal; and

a digital signal processor for processing said baseband signal to recover said plurality of information bits, said digital signal processor configured for performing an algorithm for:

for a first channel characterization over a first combined frequency and timing search space,

calculating a first noise estimation for a first frequency and timing offset pair in said first combined frequency and timing search space;

calculating at least a second noise estimation for a second frequency and timing offset pair in said first combined frequency and timing search space; and

determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations;

for at least a second channel characterization over a second combined frequency and timing search space,

calculating a first noise estimation for a first frequency and timing offset pair in said second combined frequency and timing search space;

calculating at least a second noise estimation for a second frequency and timing offset pair in said second combined frequency and timing search space; and

determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and

selecting a minimum noise estimation from said preliminary minimum noise estimation, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation and said timing error is the timing offset corresponding to said minimum noise estimation, wherein said frequency error, said timing error, and the channel characterization corresponding to said minimum noise estimation is used in recovering said plurality of information bits.